SECTION 4.0 STANDARD APPLICATION PROCESS

The Standard Application Process provides a six-step method for comparing pollutant loads before and after development, and assessing the appropriate stormwater best management practice (BMP) for a given site (Figure 4.1). The pollutant loading methodology is based on relationships between impervious cover and concentrations of pollutants found in urban runoff as defined by the Simple Method (Schueler, 1987). The Simple Method is discussed in detail in Appendix C.

Worksheet A (page 4-11) guides the applicant through Steps 1 to 5 of the Standard Application Process. Worksheet B (page 4-19) guides the applicant through Step 6 of the process and should be completed when an applicant proposes to treat an off-site area with an on-site BMP, proposes to construct a new retrofit BMP, or proposes to convert an existing BMP to achieve higher pollutant removal.

Step 1: Calculate Existing and Proposed Site Imperviousness

In this step, the applicant calculates the impervious cover of the predevelopment (existing) and post-development (proposed) site conditions. Next, the applicant adjusts the post-development impervious cover to account for any non-structural stormwater BMPs planned for the site. Lastly, the applicant must determine whether the site should be classified as new development or redevelopment.

Impervious cover is defined as those surfaces on the site that impede the infiltration of rainfall and result in an increased volume of surface runoff. As a simple rule, human-made surfaces that are not vegetated will be considered impervious. Impervious surfaces include roofs, buildings, paved streets and parking areas and any concrete, asphalt, compacted dirt or compacted gravel surface. Table 4.1 identifies which surfaces are typically considered impervious.

<u>Measuring Impervious Cover at the Project Site</u>

- Existing and proposed impervious cover must be measured directly from the most recent and accurate site plan.
- A table of measured values listed specifically for each impervious cover type (roads, rooftops, etc.) must be submitted. The use of a planimeter is recommended (See Worksheet A: Standard Application Process).
- Estimates of impervious cover based on general land use type or hydrologic modeling programs, (e.g., TR-55), are not allowed for submission.
- If land is subdivided prior to construction, it is recommended that the applicant complete the Standard Application Process at the time of initial subdivision, with imperviousness calculated using maximum building envelopes and proposed road layouts.

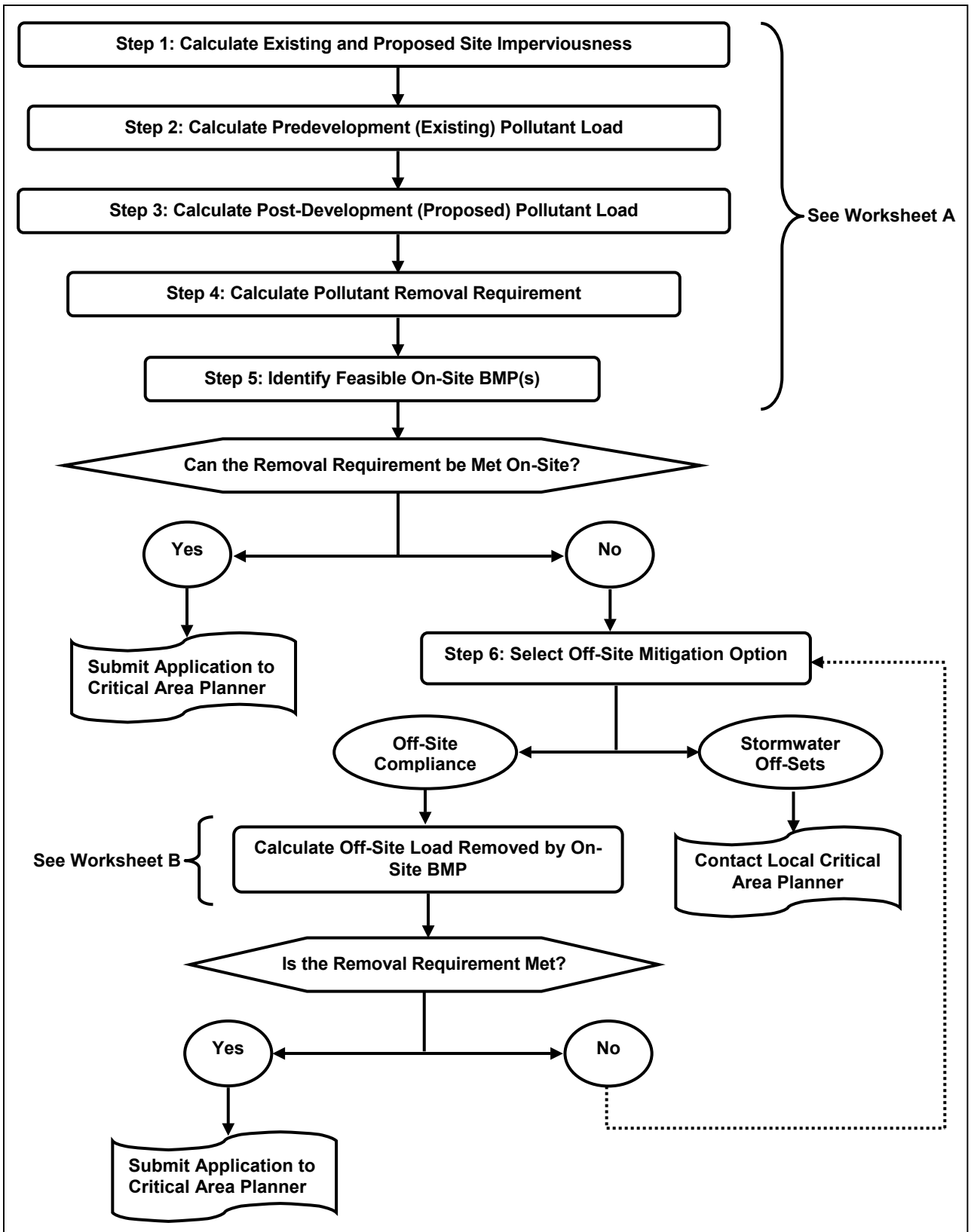

Figure 4.1 Standard Application Process

Table 4.1 Detailed Definitions of Impervious Cover		
Surface	**Impervious?**	**Design Suggestions**
Roads / Parking Lots		
paved/concrete gravel dirt	yes	• minimize road width • avoid curb and gutters • use the grass channel non-structural BMP option
Driveways		
paved gravel/shell dirt	yes	• minimize surface area • use the permeable pavers non-structural BMP option
permeable pavers	partial	• perviousness ranges from 10 to 50%, depending on the product • must be installed to the manufactures specifications • applicant should collaborate with the local government to determine exact imperviousness
porous pavement	partial	• applicant should collaborate with the local government to determine exact imperviousness
Sidewalks / Paths		
paved gravel	yes	• minimize surface area • use the permeable pavers non-structural BMP option
permeable pavers	partial	• perviousness ranges from 10 to 50%, depending on the product • must be installed to the manufactures specifications • applicant should collaborate with the local government to determine exact imperviousness
porous pavement	partial	• applicant should collaborate with the local government to determine exact imperviousness
wood chip	no	
Rooftops		
shingle / asphalt	yes	• use the filter strip or vegetated rooftop non-structural BMP option
Vegetated	no	
Decks	no	• must be designed and constructed per Pervious Deck Design guidance in Appendix F
Swimming Pools / Landscaping Ponds	yes	
Structural BMPs	no	

Accounting for Non-Structural BMPs

The proposed impervious cover for the site can be reduced if certain non-structural BMPs are installed on the site. Non-structural BMPs can reduce the impervious cover of the site in one of two ways:

1. The surface area of the non-structural BMP itself is not considered to be impervious, or is assigned a percent imperviousness.

2. All or a portion of the impervious surface area draining to the non-structural BMP (or the "disconnected impervious area") is subtracted from the total proposed site impervious area.

Table 4.2 shows how to reduce the proposed impervious cover for each of the non-structural BMP options, along with design criteria.

For most of the non-structural BMPs, design criteria are available from the 2000 Maryland Stormwater Design Manual (MDE Manual). Table 4.3 provides an overview of the relationship between 10% Rule compliance and the MDE Manual stormwater credits.

Table 4.2 Application of Non-Structural BMP Options

Non-Structural BMP Option	Impervious Area Adjustment	Design Criteria Reference
Strategies to Disconnect Rooftop Runoff		
Filter Strip	DA	• *Disconnection of Rooftop Runoff Credit*
Strategies to Store Rooftop Runoff		
Vegetated Rooftop	SA	• See Appendix E
Strategies to Disconnect Non-Rooftop Runoff		
Permeable Pavers	SA	• Perviousness ranges from 10 to 50%, depending on the product • See Appendix E
Grass Channel	DA	• *Grass Channel Credit*
Approved on a Case-by-Case Basis		
Porous Pavement	SA	• See Appendix E
Cisterns	DA	• See Appendix E
DA = Impervious area draining to the non-structural BMP is subtracted from the total impervious cover SA = Surface area of the BMP itself is not considered to be impervious		

Table 4.3 Relationship Between 10% Rule Compliance and the Maryland Stormwater Design Manual Stormwater Credits	
MDE Manual Stormwater Credit	**How the Credit is Incorporated into the 10% Calculations**
1. Natural Area Conservation	• Application of this credit does not change the way calculations are done for the 10% Rule. • Total site area, including the natural area conservation area, is used in the 10% Rule calculations. • The natural area conserved is not impervious.
2. Disconnection of Rooftop Runoff	• Application of this credit reduces the post-development site imperviousness used to calculate the average annual load of total phosphorus exported from the post-development site. • The disconnected impervious surface area is deducted from total impervious surface area when calculating proposed imperviousness. • See Worksheet A, Step 1.
3. Disconnection of Non Rooftop Runoff	• If the runoff is directed to a grass channel, application of this credit reduces the post-development site imperviousness used to calculate the average annual load of total phosphorus exported from the post-development site. • The disconnected impervious surface area is deducted from total impervious surface area when calculating proposed imperviousness. • See Worksheet A, Step 1.
4. Sheet Flow to Buffers	• Application of this credit does not change the way calculations are done for the 10% Rule. • Total site area, including the 100-foot Critical Area Buffer area on the site, is used in 10% Rule calculations. • Any impervious area draining to the 100-foot Critical Area Buffer is still considered impervious, and is included in impervious cover when calculating the post-development pollutant load.
5. Grass Channel Use	• Application of this credit reduces the post-development site imperviousness used to calculate the average annual load of total phosphorus exported from the post-development site. • The disconnected impervious surface area is deducted from total impervious surface area when calculating proposed imperviousness.
6. Environmentally Sensitive Development	• If the Credit has been applied to a Single Lot Development, the application process outlined in Section 5, Residential Approach, must still be followed. • If the Credit has been applied to a Multiple Lot Development, the 10% Rule calculations must still be completed and the 10% Rule worksheets must still be submitted.

Define Development Classification

The next step is to classify the proposed development as one of the following: 1) new development, 2) redevelopment or 3) single lot residential. (Classifications 1 and 2 are based on predevelopment impervious cover and lot size):

- New development is defined as a project having a predevelopment impervious cover less than 15%.
- Redevelopment is defined as a project having predevelopment impervious cover of 15% or more.
- Single Lot Residential Development is defined as a project on an individual residential lot.

If the proposed development is classified as Single Lot Residential Development, the Standard Application Process does not apply. The applicant should reference Section 5, Residential Approach, for detailed criteria and requirements.

Step 2: Calculate Predevelopment Phosphorus Load

In this step, the applicant calculates stormwater phosphorus loadings from the site prior to development. Depending on the development classification, the applicant will use one of two equations (Table 4.4). The equation to determine phosphorus loading in a redevelopment situation is based on the Simple Method (Appendix C). The equation to determine phosphorus loading in a new development situation utilizes a benchmark load for undeveloped areas, which is based on average phosphorus loadings for a typical mix of undeveloped land uses.

The information needed for these calculations includes:

- the area of the site within the IDA of the Critical Area
- pre-development (existing) site imperviousness

Table 4.4 Method For Calculating Predevelopment Phosphorus Loading

New Development Phosphorus Loading, $L_{pre} = 0.5 (A)$

Where:

L_{pre}	=	Average annual load of total phosphorus exported from the site prior to development (lbs/year)
0.5	=	Annual total phosphorus load from undeveloped lands (lbs/acre/year)
A	=	Area of the site within the IDA Critical Area (acres)

Table 4.4 Method For Calculating Predevelopment Phosphorus Loading

Redevelopment Phosphorus Loading, $L_{pre} = (R_v)\ (C)\ (A)\ 8.16$

Where:

L_{pre}	=	Average annual load of total phosphorus exported from the site prior to development (lbs/year)
R_v	=	Runoff coefficient = 0.05 + 0.009 (I_{pre})
I_{pre}	=	Predevelopment (existing) site imperviousness (i.e., I = 75 if site is 75% impervious)
C	=	Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A	=	Area of the site within the Critical Area IDA (acres)
8.16	=	Includes regional constants and unit conversion factors

Step 3: Calculate Post-Development Pollutant Load

In this step, the applicant calculates stormwater phosphorus loadings from the post-development, or proposed, site. Again, an abbreviated version of the Simple Method (Appendix C) is used for the calculations, and the equation is the same for both new development and redevelopment sites (Table 4.5).

Table 4.5 Method For Calculating Post-Development Phosphorus Loading

Post-Development Phosphorus Loading, $L_{post} = (R_v)\ (C)\ (A)\ 8.16$

Where:

L_{post}	=	Average annual load of total phosphorus exported from the post-development site (lbs/year)
R_v	=	Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
	=	0.05 + 0.009 (I)
I_{post}	=	Post-development (proposed) site imperviousness (i.e., I = 75 if site is 75% impervious)
C	=	Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A	=	Area of the site within the Critical Area IDA (acres)
8.16	=	Includes regional constants and unit conversion factors

Step 4: Calculate the Pollutant Removal Requirement

The phosphorus load generated from the post-development site must be reduced so that it is at least 10% less than the load generated prior to development. The amount of phosphorus that must be removed through the use of stormwater BMPs is called the Pollutant Removal Requirement (RR). The equation in Table 4.6 expresses this term numerically.

Table 4.6 Computing Pollutant Removal Requirements

Pollutant Removal Requirement, RR = L_{post} - 0.9(L_{pre})

Where:

RR	=	Pollutant removal requirement (lbs/year)
L_{post}	=	Average annual load of total phosphorus exported from the post-development site (lbs/year)
L_{pre}	=	Average annual load of total phosphorus exported from the site prior to development (lbs/year)

Step 5: Identify Feasible Structural BMPs

Structural BMPs that may be used to comply with the 10% Rule are described in Appendix E. These BMPs are subject to the performance and design criteria set forth by the 2000 Maryland Stormwater Design Manual.

Structural BMP options must be shown to be feasible for the site both in terms of physical suitability and pollutant removal capabilities. It should be noted that the Structural BMPs which survive the screening procedure still need to undergo more detailed design checks and field tests to confirm that they are actually feasible. Evidence of site feasibility will be required as part of the final submittal package.

Physical Suitability

The 2000 Maryland Stormwater Design Manual outlines a process for selecting the best BMP or group of BMPs for a site and provides guidance on factors to consider when deciding where to locate them. The process guides the designer through six steps that progressively screen the following issues:

- Watershed factors
- Terrain factors
- Stormwater treatment suitability
- Physical feasibility factors
- Community and environmental factors
- Locational and permitting factors

The matrices for this screening process are presented in Chapter 4 of the 2000 Maryland Stormwater Design Manual, which may be accessed online at:

www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp

Pollutant Removal Feasibility

The second step used to determine feasibility relates to the ability of the chosen BMP to meet the pollutant removal requirements of the 10% Rule. The pollutant load removed by each BMP (Table 4.7) is calculated using the BMP removal efficiency (Table 4.8), the computed post-development load, and the drainage area served.

Table 4.7 Estimate of Pollutant Load Removed by Each BMP

Load Removed, LR = (L_{post}) (BMP_{RE}) (% DA Served)

Where:

LR	=	Annual total phosphorus load removed by the proposed BMP (lbs/year)
L_{post}	=	Average annual load of total phosphorus exported from the post-development site prior to development (lbs/year)
BMP_{RE}	=	BMP removal efficiency for total phosphorus, Table 4.8 (%)
% DA Served	=	Fraction of the drainage area served by the BMP (%)

Table 4.8 BMP Removal Rates for Total Phosphorus

Code	BMP	Total Phosphorus Removal Efficiency (%)
P-1	Micropool ED	40%
P-2	Wet Pond	50%
P-3	Wet ED Pond	60%
P-4	Multiple Pond	65%
P-5	Pocket Pond	50%
W-1	Shallow Wetland	40%
W-2	ED Wetland	40%
W-3	Pond/Wetland	55%
W-4	Pocket Wetland	40%
I-1	Infiltration Trench	65%
I-2	Infiltration Basin	65%
F-1	Surface Sand Filter	50%
F-2	Underground Sand Filter	50%
F-3	Perimeter Sand Filter	50%
F-4	Organic Filter	50%
F-5	Pocket Sand Filter	40%
F-6	Bioretention	50%
O-1	Dry Swale	65%
O-2	Wet Swale	40%

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule. If not, the designer must evaluate alternative BMP designs to achieve higher removal efficiencies, add additional BMPs, design the project so that more of the site is treated by the proposed BMPs, or design the BMP to treat runoff from an off-site area.

Worksheet A: Standard Application Process

Calculating Pollutant Removal Requirements[1]

Step 1: Calculate Existing and Proposed Site Imperviousness

A. Calculate Percent Imperviousness

1) Site Area within the Critical Area IDA, A = _____ acres

2) Site Impervious Surface Area, Existing and Proposed, (See Table 4.1 for details)

	(a) Existing (acres)	(b) Proposed (acres)
Roads	_____	_____
Parking lots	_____	_____
Driveways	_____	_____
Sidewalks/paths	_____	_____
Rooftops	_____	_____
Decks	_____	_____
Swimming pools/ponds	_____	_____
Other	_____	_____
Impervious Surface Area	_____	_____

3) Imperviousness (I)

Existing Imperviousness, I_{pre} = Impervious Surface Area / Site Area
= (Step 2a) / (Step 1)
= (_____) / (_____)
= _____ %

Proposed Imperviousness, I_{post} = Impervious Surface Area / Site Area
= (Step 2b) / (Step 1)
= (_____) / (_____)
= _____ %

B. Define Development Category (circle)

1) New Development: Existing imperviousness less than 15% I *(Go to Step 2A)*

2) Redevelopment: Existing imperviousness of 15% I or more *(Go to Step 2B)*

3) Single Lot Residential Development: Single lot being developed or improved; single family residential development; and more than 250 square feet of impervious area and associated disturbance (Go to Section 5, Residential Approach, for detailed criteria and requirements).

[1] NOTE: All acreage used in this worksheet refers to areas within the IDA of the Critical Area only.

Step 2: Calculate the Predevelopment Load (L_{pre})

A. New Development

L_{pre} = (0.5) (A)

= (0.5) (_____)

= _____ lbs /year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
0.5 = Annual total phosphorus load from undeveloped lands (lbs/acre/year)
A = Area of the site within the Critical Area IDA (acres)

B. Redevelopment

L_{pre} = (R_v) (C) (A) (8.16)

R_v = 0.05 + 0.009 (I_{pre})

= 0.05 + 0.009 (_____) = _____

L_{pre} = (_____) (_____) (_____) (8.16)

= _____ lbs/year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{pre} = Pre-development (existing) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 3: Calculate the Post-Development Load (L_{post})

A. New Development and Redevelopment:

L_{post} = (R_v) (C) (A) (8.16)

R_v = 0.05 + 0.009 (I_{post})

= 0.05 + 0.009 (_____) = _____

L_{post} = (_____) (_____) (_____) (8.16)

= _____ lbs/year of total phosphorus

Where:

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{post} = Post-development (proposed) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 4: Calculate the Pollutant Removal Requirement (RR)

RR = L_{post} - (0.9) (L_{pre})

= (_____) - (0.9) (_____)

= _____ lbs/year of total phosphorus

Where:

RR = Pollutant removal requirement (lbs/year)
L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)

Step 5: Identify Feasible BMP(s)

Select BMP Options using the screening matrices provided in the Chapter 4 of the 2000 Maryland Stormwater Design Manual. Calculate the load removed for each option.

BMP Type	(L_{post})	x	(BMP_{RE})	x	(% DA Served)	=	LR
_____	_____	x	_____	x	_____	=	_____ lbs/year
_____	_____	x	_____	x	_____	=	_____ lbs/year
_____	_____	x	_____	x	_____	=	_____ lbs/year
_____	_____	x	_____	x	_____	=	_____ lbs/year

Load Removed, LR (total) = _____ lbs/year

Pollutant Removal Requirement, RR (from Step 4) = _____ lbs/year

Where:

Load Removed, LR = Annual total phosphorus load removed by the proposed BMP (lbs/year)

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)

BMP_{RE} = BMP removal efficiency for total phosphorus, Table 4.8 (%)

% DA Served = Fraction of the site area within the critical area IDA served by the BMP (%)

RR = Pollutant removal requirement (lbs/year)

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule.

Has the RR (pollutant removal requirement) been met? ☐ **Yes** ☐ **No**

Step 6: Select Off-Site Mitigation Option

If the pollutant removal requirement has been met through the application of on-site stormwater BMPs and non-structural BMPs, the Standard Application Process is complete and the application may be submitted to the local Critical Area plan reviewer.

In the event that on-site BMPs cannot fully meet the pollutant removal requirement and on-site design cannot be changed, two options exists for off-site mitigation:

- *Stormwater Offsets.* Compliance achieved by using alternatives to the construction of an on-site or off-site BMP. Examples of offset projects are provided in Table 4.9, and Section 6.0, Offset Program, describes Stormwater Offsets in detail.

- *Off-Site Compliance.* Compliance achieved by treatment of off-site drainage areas with an on-site BMP.

Table 4.9 Examples of Acceptable Stormwater Offset Projects

Having shown that on-site compliance is not feasible, the applicant may choose from the following offset options (see Section 6, Offset Program for more details):

- Construct a new BMP
- Convert an existing BMP to achieve higher pollutant removal
- Modify the existing conveyance network to enhance pollutant removal
- Reduce the imperviousness of an existing property
- Restore a degraded tidal or non-tidal wetland
- Restore a channelized stream
- Daylight a stream
- Implement a riparian reforestation project
- Install trash interceptors on existing stormwater inlets
- Improve existing stormwater ponds by planting forested buffer areas around the facility
- Develop and implement a public education program about stormwater management in conjunction with local government
- Over-design another pending project

Worksheet B: Standard Application Process must be completed if off-site compliance is proposed for a site. This includes projects where an applicant proposes to treat an off-site area with an on-site BMP, proposes to construct a new retrofit BMP, or proposes to convert an existing BMP to achieve higher pollutant removal. If multiple BMPs are used to treat off-site drainage areas, Worksheet B should be completed for each BMP.

Worksheet B, Step 1
In Step 1, the applicant calculates the impervious cover of the off-site drainage area to be treated by the on-site BMP. The impervious cover should reflect the *ultimate* conditions of the site, or the impervious cover of the site that will be draining to the completed BMP. Table 4.1 describes which surfaces are impervious and which are not.

The applicant then uses the ultimate off-site impervious cover to classify the off-site drainage area as either new development or redevelopment:

- New Development is defined as a site having an impervious cover less than 15%
- Redevelopment is defined as a site having an impervious cover of 15% or more

Worksheet B, Step 2
In this step the applicant calculates storm loadings of phosphorus from the off-site drainage area. Depending on the off-site drainage area classification, the applicant will use one of two equations (Table 4.10).

The information needed for these calculations includes:

- the off-site drainage area to be treated by the on-site BMP
- the ultimate off-site impervious cover

Table 4.10 Method For Calculating Post-Development Phosphorus Loading for Off-site Drainage Area

When:
Ultimate impervious cover of the off-site drainage area to be treated by the on-site BMP is **less than 15%**

Use:

New Development Phosphorus Loading, $L_{off\text{-}site} = 0.5 (A_{off\text{-}site})$

Where:

$L_{off\text{-}site}$	=	Average annual load of total phosphorus exported from the site prior to development (lbs/year)
0.5	=	Annual total phosphorus load from undeveloped lands (lbs/acre/year)
$A_{off\text{-}site}$	=	Off-site drainage area to be treated by on-site BMP (acres)

Table 4.10 Method For Calculating Post-Development Phosphorus Loading for Off-site Drainage Area

When:
Ultimate impervious cover of the off-site drainage area to be treated by the on-site BMP is **15% or more**

Use:

Off-site Phosphorus Loading, $L_{off\text{-}site} = (R_v)\ (C)\ (A_{off\text{-}site})\ 8.16$

Where:

$L_{off\text{-}site}$	=	Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)
R_v	=	Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
	=	$0.05 + 0.009\ (I_{off\text{-}site})$
$I_{off\text{-}site}$	=	Ultimate off-site imperviousness (i.e., I = 75 if site is 75% impervious)
C	=	Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
$A_{off\text{-}site}$	=	Off-site drainage area to be treated by on-site BMP (acres)
8.16	=	Includes regional constants and unit conversion factors

Worksheet B, Step 3
In this step, the applicant calculates the load removed from the off-site drainage area by the on-site BMP. It is important to note that the BMP should be designed to provide treatment for the entire area draining to it, both on-site and off-site, per the MDE Manual.

The pollutant load removed is calculated using the BMP removal efficiency (Table 4.8), and the computed off-site load (Table 4.11).

Table 4.11 Off-Site Pollutant Load Removed by On-Site BMP

Off-Site Load Removed = $(BMP_{RE})\ (L_{off\text{-}site})$

Where:

BMP_{RE}	=	BMP removal efficiency for total phosphorus, Table 4.8 (%)
$L_{off\text{-}site}$	=	Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

Worksheet B, Step 4
In Step 4, the applicant calculates the total load removed by the on-site BMP (Table 4.12).

Table 4.12 Total Load Removed by On-Site BMP

Total Load Removed = Load Removed On-Site + Load Removed Off-Site

Worksheet B: Standard Application Process

Calculating Removal from Off-site Drainage Areas

Step 1: Project Description

A. Calculate Percent Imperviousness

1) Off-site Drainage Area to be Treated by On-site BMP, $A_{off\text{-}site}$ = _____ acres

2) Ultimate Off-site Drainage Area Imperviousness

(a) Ultimate Off-site Impervious Area (acres)

Roads	_____ (acres)
Parking Lots	_____ (acres)
Driveways	_____ (acres)
Sidewalks/paths	_____ (acres)
Rooftops	_____ (acres)
Decks	_____ (acres)
Swimming pools/ponds	_____ (acres)
Other	_____ (acres)

Total Off-site Impervious Area (sum of the above) = _____ (acres)

(b) Ultimate Off-site Imperviousness ($I_{off\text{-}site}$)

Off-site Imperviousness ($I_{off\text{-}site}$) = Total Off-site Impervious Area / $A_{off\text{-}site}$

= (Step 2a) / (Step 1)

= (_____) / (_____)

= _____ %

B. Define Development Category of Off-site Drainage Area

1) New Development: Ultimate imperviousness of off-site drainage area less than 15% I *(Go to Step 2A)*

2) Redevelopment: Ultimate imperviousness of off-site drainage area greater than or equal to 15% I *(Go to Step 2B)*

Step 2: Calculate Post-Development Load for Off-site Drainage Area ($L_{off-site}$)

A. New Development

$L_{off-site}$ = 0.5 ($A_{off-site}$)

= 0.5 (_____)

= _____ lbs/year of total phosphorus

Where:

$L_{off-site}$ = Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

0.5 = Annual total phosphorus load from undeveloped lands (lbs/acre/year)

$A_{off-site}$ = Off-site drainage area to be treated by on-site BMP (acres)

B. Redevelopment

$L_{off-site}$ = (R_v) (C) ($A_{off-site}$) 8.16

R_v = 0.05 + 0.009 ($I_{off-site}$)

= 0.05 + 0.009 (_____) = _____

$L_{off-site}$ = (_____) (_____) (_____) 8.16

= _____ lbs/year of total phosphorus

Where:

$L_{off-site}$ = Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff

$I_{off-site}$ = Ultimate off-site imperviousness (i.e. I = 75 if site is 75% impervious)

C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l

$A_{off-site}$ = Off-site drainage area to be treated by on-site BMP (acres)

8.16 = Includes regional constants and unit conversion factors

Step 3: Calculate the Load Removed from Off-site Drainage Areas by On-site BMP

Type of BMP: _____

Off-site Load Removed = (BMP_{RE}) $(L_{off\text{-}site})$

= (_____) (_____)

= _____ lbs/year of total phosphorus

Where:
BMP_{RE} = BMP removal efficiency for total phosphorus, see Table 4.8 (%)
$L_{off\text{-}site}$ = Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

Step 4: Calculate the Total Load Removed by On-site and Off-site BMPs

Total Load Removed = Load Removed On-site + Load Removed Off-site

= (Worksheet A, Step 5) + (Step 3)

= (_____) + (_____)

= _____ lbs/year of total phosphorus

Pollutant Removal Requirement (Worksheet A, Step 4) = _____ lbs/year

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule.

Has the Pollutant Removal Requirement been met? ☐ **Yes** ☐ **No**

Standard Application for Simple On-Site Compliance – New Development

The following example presents a step-by-step process for completing the Standard Application Process for a simple new development situation. The existing and proposed site plans are displayed below (Figure 4.2) and the completed "Worksheet A: Standard Application Process."

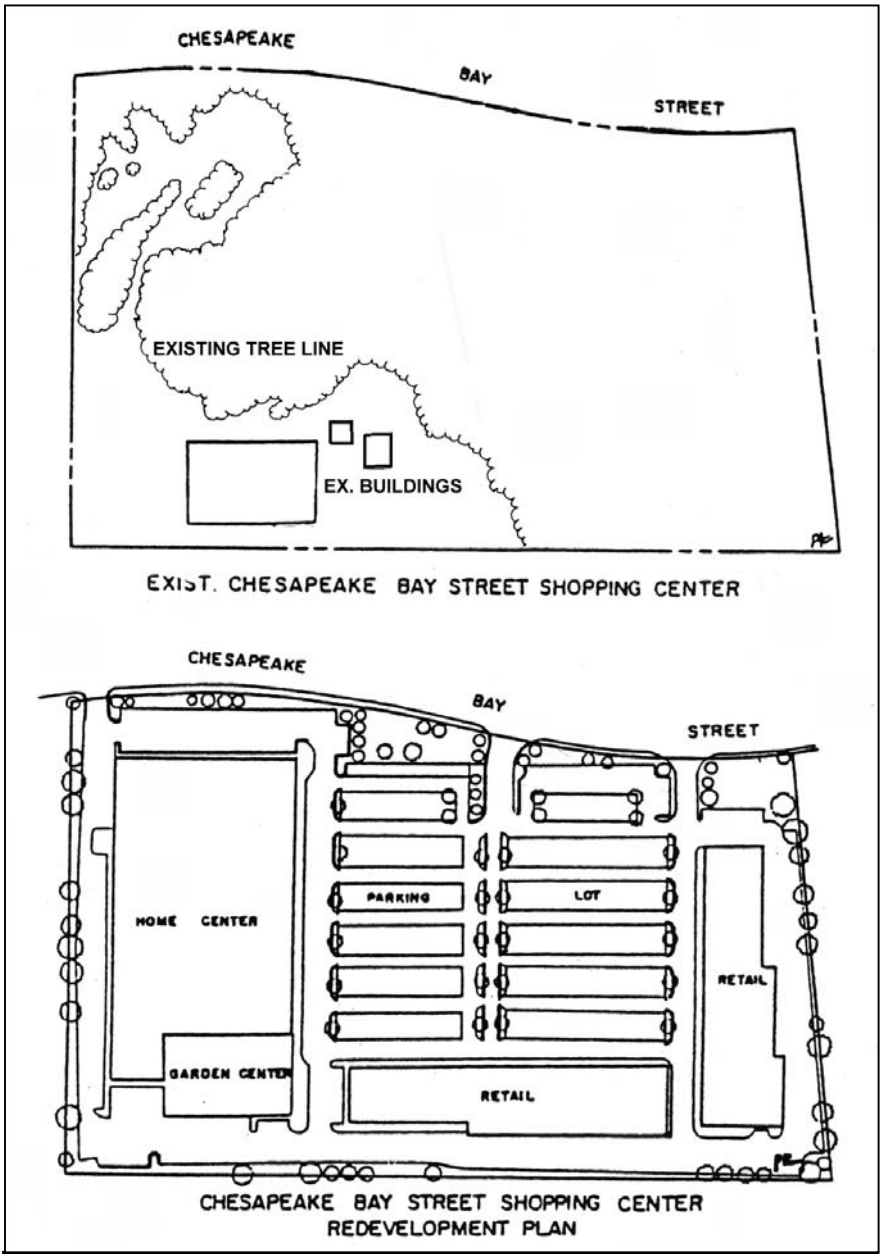

Figure 4.2 Existing and Proposed Site Plans for Simple On-Site Compliance Example

Worksheet A: Standard Application Process

Calculating Pollutant Removal Requirements[1]

Step 1: Calculate Existing and Proposed Site Imperviousness

A. Calculate Percent Imperviousness

1) Site Area within the Critical Area IDA, A = **15** acres

2) Site Impervious Surface Area, Existing and Proposed, (See Table 4.1 for details)

	(a) Existing (acres)	(b) Proposed (acres)
Roads		**2.40**
Parking lots		**5.30**
Driveways		
Sidewalks/paths		**0.15**
Rooftops	**0.75**	**4.52**
Decks		
Swimming pools/ponds		
Other		
Impervious Surface Area	**0.75 acres**	**12.37 acres**

3) Imperviousness (I)

Existing Imperviousness, I_{pre} = Impervious Surface Area / Site Area
= (Step 2a) / (Step 1)
= (**0.75**) / (**15**)
= **0.05 or 5** %

Proposed Imperviousness, I_{post} = Impervious Surface Area / Site Area
= (Step 2b) / (Step 1)
= (**12.37**) / (**15**)
= **0.8247 or 82** %

B. Define Development Category (circle)

1) New Development: Existing imperviousness less than 15% I *(Go to Step 2A)*

2) Redevelopment: Existing imperviousness of 15% I or more *(Go to Step 2B)*

3) Single Lot Residential Development: Single lot being developed or improved; single family residential development; and more than 250 square feet of impervious area and associated disturbance (Go to Section 5, Residential Approach, for detailed criteria and requirements).

[1] NOTE: All acreage used in this worksheet refers to areas within the IDA of the Critical Area only.

Step 2: Calculate the Predevelopment Load (L_{pre})

A. New Development

L_{pre} = (0.5) (A)

= (0.5) (**15 acres**)

= **7.5** lbs /year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
0.5 = Annual total phosphorus load from undeveloped lands (lbs/acre/year)
A = Area of the site within the Critical Area IDA (acres)

B. Redevelopment

L_{pre} = (R_v) (C) (A) (8.16)

R_v = 0.05 + 0.009 (I_{pre})

= 0.05 + 0.009 (_____) = _____

L_{pre} = (_____) (_____) (_____) (8.16)

= _____ lbs/year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{pre} = Predevelopment (existing) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 3: Calculate the Post-Development Load (L_{post})

A. New Development and Redevelopment:

L_{post} = (R_v) (C) (A) (8.16)

R_v = $0.05 + 0.009 (I_{post})$

= 0.05 + 0.009 (**82**) = **0.79**

L_{post} = (**0.79**) (**0.30**) (**15**) (8.16)

= **29.0** lbs/year of total phosphorus

Where:

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{post} = Post-development (proposed) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 4: Calculate the Pollutant Removal Requirement (RR)

RR = $L_{post} - (0.9) (L_{pre})$

= (**29.0**) - (0.9) (**7.5**)

= **22.3** lbs/year of total phosphorus

Where:

RR = Pollutant removal requirement (lbs/year)
L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)

Step 5: Identify Feasible BMP(s)

Select BMP Options using the screening matrices provided in the Chapter 4 of the 2000 Maryland Stormwater Design Manual. Calculate the load removed for each option.

BMP Type	(L_{post})	x	(BMP_{RE})	x	(% DA Served)	=	LR	
bioretention	**29.0**	x	**50%**	x	**40%**	=	**5.8**	lbs/year
dry swale	**29.0**	x	**65%**	x	**30%**	=	**5.7**	lbs/year
infiltration trench	**29.0**	x	**65%**	x	**30%**	=	**5.7**	lbs/year
		x		x		=		lbs/year

Load Removed, LR (total) = **17.2** lbs/year

Pollutant Removal Requirement, RR (from Step 4) = **22.3** lbs/year

Where:

Load Removed = Annual total phosphorus load removed by the proposed BMP (lbs/year)

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)

BMP_{RE} = BMP removal efficiency for total phosphorus, Table 4.8 (%)

% DA Served = Fraction of the site area within the critical area IDA served by the BMP (%)

RR = Pollutant removal requirement (lbs/year)

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule.

Has the RR (pollutant removal requirement) been met? ☐ **Yes** ☑ **No**

NOTE: Alternative off-site mitigation options or off-sets will be required. Applicant will discuss options with local planning department.

Standard Application for Simple On-Site Compliance – Redevelopment

The following example presents a step-by-step process for completing the Standard Application Process for a simple redevelopment situation. The existing and proposed site plans are displayed below (Figure 4.3) and the completed "Worksheet A: Standard Application Process."

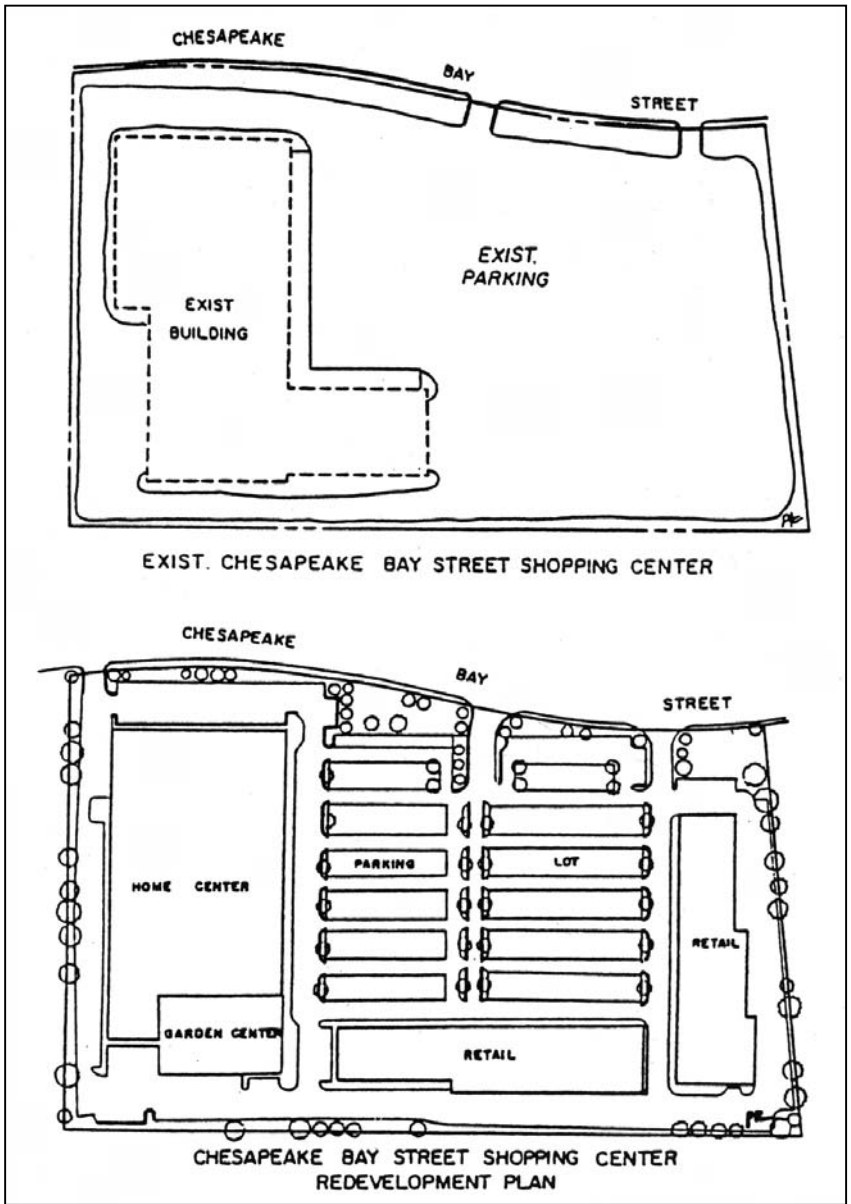

Figure 4.3 Existing and Proposed Site Plans for Simple On-Site Compliance Example

Worksheet A: Standard Application Process

Calculating Pollutant Removal Requirements[1]

Step 1: Calculate Existing and Proposed Site Imperviousness

A. Calculate Percent Imperviousness

1) Site Area within the Critical Area IDA, A = **15** acres

2) Site Impervious Surface Area, Existing and Proposed, (See Table 4.1 for details)

	(a) Existing (acres)	(b) Proposed (acres)
Roads	**2.20**	**2.40**
Parking lots	**6.75**	**5.30**
Driveways		
Sidewalks/paths		**0.15**
Rooftops	**3.10**	**4.52**
Decks		
Swimming pools/ponds		
Other		
Impervious Surface Area	**12.05 acres**	**12.37 acres**

3) Imperviousness (I)

Existing Imperviousness, I_{pre} = Impervious Surface Area / Site Area
= (Step 2a) / (Step 1)
= (**12.05**) / (**15**)
= **0.8033 or 80** %

Proposed Imperviousness, I_{post} = Impervious Surface Area / Site Area
= (Step 2b) / (Step 1)
= (**12.37**) / (**15**)
= **0.8247 or 82** %

B. Define Development Category (circle)

1) New Development: Existing imperviousness less than 15% I *(Go to Step 2A)*

2) (Redevelopment:) Existing imperviousness of 15% I or more *(Go to Step 2B)*

3) Single Lot Residential Development: Single lot being developed or improved; single family residential development; and more than 250 square feet of impervious area and associated disturbance (Go to Section 5, Residential Approach, for detailed criteria and requirements).

[1] NOTE: All acreage used in this worksheet refers to areas within the IDA of the Critical Area only.

Step 2: Calculate the Predevelopment Load (L_{pre})

A. New Development

L_{pre} = (0.5) (A)

= (0.5) (_____)

= _____ lbs/year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
0.5 = Annual total phosphorus load from undeveloped lands (lbs/acre/year)
A = Area of the site within the Critical Area IDA (acres)

B. Redevelopment

L_{pre} = (R_v) (C) (A) (8.16)

R_v = 0.05 + 0.009 (I_{pre})

= 0.05 + 0.009 (**80**) = **0.77**

L_{pre} = (**0.77**) (**0.30**) (**15**) (8.16)

= **28.27** lbs/year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{pre} = Predevelopment (existing) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 3: Calculate the Post-Development Load (L_{post})

A. New Development and Redevelopment:

L_{post} = (R_v) (C) (A) (8.16)

R_v = 0.05 + 0.009 (I_{post})

= 0.05 + 0.009 (**82**) = **0.79**

L_{post} = (**0.79**) (**0.30**) (**15**) (8.16)

= **29.0** lbs/year of total phosphorus

Where:

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{post} = Post-development (proposed) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 4: Calculate the Pollutant Removal Requirement (RR)

RR = L_{post} - (0.9) (L_{pre})

= (**29.0**) - (0.9) (**28.27**)

= **3.56** lbs/year of total phosphorus

Where:

RR = Pollutant removal requirement (lbs/year)
L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)

Step 5: Identify Feasible BMP(s)

Select BMP Options using the screening matrices provided in the Chapter 4 of the 2000 Maryland Stormwater Design Manual. Calculate the load removed for each option.

BMP Type	(L_{post})	x	(BMP_{RE})	x	(% DA Served)	=	LR	
bioretention	**29.0**	x	**50%**	x	**20%**	=	**2.90**	lbs/year
perimeter sand filter	**29.0**	x	**50%**	x	**10%**	=	**1.45**	lbs/year
		x		x		=		lbs/year
		x		x		=		lbs/year

Load Removed, LR (total) = **4.35** lbs/year

Pollutant Removal Requirement, RR (from Step 4) = **3.56** lbs/year

Where:

Load Removed = Annual total phosphorus load removed by the proposed BMP (lbs/year)

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)

BMP_{RE} = BMP removal efficiency for total phosphorus, Table 4.8 (%)

% DA Served = Fraction of the site area within the critical area IDA served by the BMP (%)

RR = Pollutant removal requirement (lbs/year)

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule.

Has the RR (pollutant removal requirement) been met? ☑ **Yes** ☐ **No**

Standard Application for Off-Site Drainage Area Treatment by On-Site BMP

The following example presents a step-by-step process for completing the Standard Application Process for a redevelopment situation where the pollutant removal requirement is met, in part, by treating runoff from an off-site drainage area with an on-site BMP. In this process, both Worksheets A and B must be used, and are included in this example.

The on-site and the off-site drainage areas to the proposed BMP are displayed in Figure 4.4.

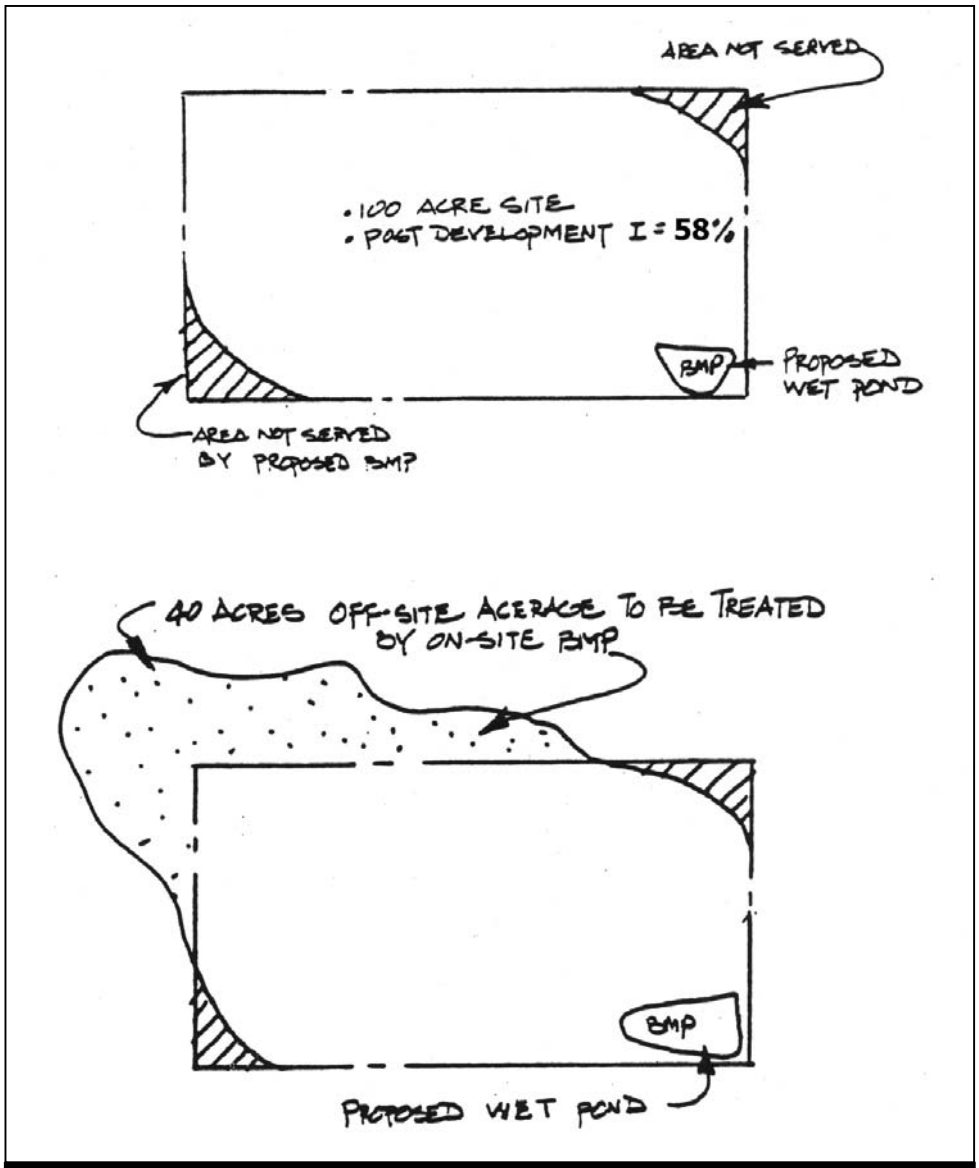

Figure 4.4 Off-Site Drainage Area to Proposed On-Site BMP

Worksheet A: Standard Application Process

Calculating Pollutant Removal Requirements[1]

Step 1: Calculate Existing and Proposed Site Imperviousness

A. Calculate Percent Imperviousness

1) Site Area within the Critical Area IDA, A = **100** acres

2) Site Impervious Surface Area, Existing and Proposed, (See Table 4.1 for details)

	(a) Existing (acres)	(b) Proposed (acres)
Roads	**1.5**	**5**
Parking lots	**8**	**10**
Driveways		
Sidewalks/paths	**0.5**	**0.5**
Rooftops	**12**	**42**
Decks		
Swimming pools/ponds		
Other		
Impervious Surface Area	**22 acres**	**57.5 acres**

3) Imperviousness (I)

Existing Imperviousness, I_{pre} = Impervious Surface Area / Site Area
= (Step 2a) / (Step 1)
= (**22**) / (**100**)
= **0.22 or 22** %

Proposed Imperviousness, I_{post} = Impervious Surface Area / Site Area
= (Step 4) / (Step 1)
= (**57.5**) / (**100**)
= **0.58 or 58** %

B. Define Development Category (circle)

1) New Development: Existing imperviousness less than 15% I *(Go to Step 2A)*

2) Redevelopment: Existing imperviousness of 15% I or more *(Go to Step 2B)*

3) Single Lot Residential Development: Single lot being developed or improved; single family residential development; and more than 250 square feet of impervious area and associated disturbance (Go to Section 5, Residential Approach, for detailed criteria and requirements.)

[1] NOTE: All acreage used in this worksheet refers to areas within the IDA of the Critical Area only.

Step 2: Calculate the Predevelopment Load (L_{pre})

A. New Development

L_{pre} = (0.5) (A)

= (0.5) (_____)

= _____ lbs /year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
0.5 = Annual total phosphorus load from undeveloped lands (lbs/acre/year)
A = Area of the site within the Critical Area IDA (acres)

B. Redevelopment

L_{pre} = (R_v) (C) (A) (8.16)

R_v = 0.05 + 0.009 (I_{pre})

= 0.05 + 0.009 (_____**22**_____) = ____**0.25**____

L_{pre} = (____**0.25**____) (____**0.30**____) (____**100**____) (8.16)

= ____**61.2**____ lbs/year of total phosphorus

Where:

L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{pre} = Predevelopment (existing) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 3: Calculate the Post-Development Load (L_{post})

A. New Development and Redevelopment:

L_{post} = (R_v) (C) (A) (8.16)

R_v = 0.05 + 0.009 (I_{post})

= 0.05 + 0.009 (**58**) = **0.57**

L_{post} = (**0.57**) (**0.30**) (**100**) (8.16)

= **139.5** lbs/year of total phosphorus

Where:

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
I_{post} = Post-development (proposed) site imperviousness (i.e., I = 75 if site is 75% impervious)
C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l
A = Area of the site within the Critical Area IDA (acres)
8.16 = Includes regional constants and unit conversion factors

Step 4: Calculate the Pollutant Removal Requirement (RR)

RR = L_{post} - (0.9) (L_{pre})

= (**139.5**) - (0.9) (**61.2**)

= **84.4** lbs/year of total phosphorus

Where:

RR = Pollutant removal requirement (lbs/year)
L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)
L_{pre} = Average annual load of total phosphorus exported from the site prior to development (lbs/year)

Step 5: Identify Feasible BMP(s)

Select BMP Options using the screening matrices provided in the Chapter 4 of the 2000 Maryland Stormwater Design Manual. Calculate the load removed for each option.

BMP Type	(L_{post})	x	(BMP_{RE})	x	(% DA Served)	=	LR	
wet ED pond	**139.5**	x	**60%**	x	**80%**	=	**67.0**	lbs/year
bioretention	**139.5**	x	**50%**	x	**5%**	=	**3.5**	lbs/year
dry swale	**139.5**	x	**65%**	x	**5%**	=	**4.5**	lbs/year
		x		x		=		lbs/year

Load Removed, LR (total) = **75.0** lbs/year

Pollutant Removal Requirement, RR (from Step 4) = **84.4** lbs/year

Where:

Load Removed = Annual total phosphorus load removed by the proposed BMP (lbs/year)

L_{post} = Average annual load of total phosphorus exported from the post-development site (lbs/year)

BMP_{RE} = BMP removal efficiency for total phosphorus, Table 4.8 (%)

% DA Served = Fraction of the site area within the critical area IDA served by the BMP (%)

RR = Pollutant removal requirement (lbs/year)

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule.

Has the RR (pollutant removal requirement) been met? ☐ **Yes** ☑ **No**

Worksheet B: Standard Application Process

Calculating Removal from Off-site Drainage Areas

Step 1: Project Description

A. Calculate Percent Imperviousness

1) Off-site Drainage Area to be Treated by On-site BMP, $A_{off\text{-}site}$ = **40** acres

2) Ultimate Off-site Drainage Area Imperviousness

(a) Ultimate Off-site Impervious Area (acres)

Roads	**5** (acres)
Parking Lots	**2** (acres)
Driveways	_____ (acres)
Sidewalks/paths	**1** (acres)
Rooftops	**8** (acres)
Decks	_____ (acres)
Swimming pools/ponds	_____ (acres)
Other	_____ (acres)

Total Off-site Impervious Area (sum of the above) = **16** (acres)

(b) Ultimate Off-site Imperviousness ($I_{off\text{-}site}$)

Off-site Imperviousness ($I_{off\text{-}site}$) = Total Off-site Impervious Area / $A_{off\text{-}site}$

= (Step 2a) / (Step 1)

= (**16**) / (**40**)

= **0.40 or 40** %

B. Define Development Category of Off-site Drainage Area

1) New Development: Ultimate imperviousness of off-site drainage area less than 15% I *(Go to Step 2A)*

2) Redevelopment: Ultimate imperviousness of off-site drainage area greater than or equal to 15% I *(Go to Step 2B)*

Step 2: Calculate Post-Development Load for Off-site Drainage Area ($L_{off-site}$)

A. New Development

$L_{off-site}$ = 0.5 ($A_{off-site}$)

= 0.5 (_____)

= _____ lbs/year of total phosphorus

Where:

$L_{off-site}$ = Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

0.5 = Annual total phosphorus load from undeveloped lands (lbs/acre/year)

$A_{off-site}$ = Off-site drainage area to be treated by on-site BMP (acres)

B. Redevelopment

$L_{off-site}$ = (R_v) (C) ($A_{off-site}$) 8.16

R_v = 0.05 + 0.009 ($I_{off-site}$)

= 0.05 + 0.009 (**40**) = **0.41**

$L_{off-site}$ = (**0.41**) (**0.30**) (**40**) 8.16

= **40.1** lbs/year of total phosphorus

Where:

$L_{off-site}$ = Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff

$I_{off-site}$ = Ultimate off-site imperviousness (i.e. I = 75 if site is 75% impervious)

C = Flow-weighted mean concentration of the pollutant (total phosphorus) in urban runoff (mg/l) = 0.30 mg/l

$A_{off-site}$ = Off-site drainage area to be treated by on-site BMP (acres)

8.16 = Includes regional constants and unit conversion factors

Step 3: Calculate the Load Removed from Off-site Drainage Areas by On-Site BMP

Type of BMP: **wet ED pond**

Off-site Load Removed = (BMP_{RE}) $(L_{off\text{-}site})$

= (**60%**) (**40.1**)

= **24.1** lbs/year of total phosphorus

Where:
BMP_{RE} = BMP removal efficiency for total phosphorus, see Table 4.8 (%)
$L_{off\text{-}site}$ = Average annual load of total phosphorus exported from the off-site drainage area (lbs/year)

Step 4: Calculate the Total Load Removed (in pounds) by On-Site BMP

Total Load Removed = Load Removed On-site + Load Removed Off-site

= (Worksheet A, Step 5) + (Step 3)

= (**75.0**) + (**24.1**)

= **99.1** lbs/year of total phosphorus

Pollutant Removal Requirement (Worksheet A, Step 4) = **84.4** lbs/year

If the Load Removed is equal to or greater than the Pollutant Removal Requirement computed in Step 4, then the on-site BMP complies with the 10% Rule.

Has the Pollutant Removal Requirement been met? ☑ **Yes** ☐ **No**